FAA AVIATION NEWS

JULY 1968

COVER

An aerial platform for your camera opens up a new world in photography. For tips on how to combine filming and flying safely, see page 4.

FAA AVIATION NEWS

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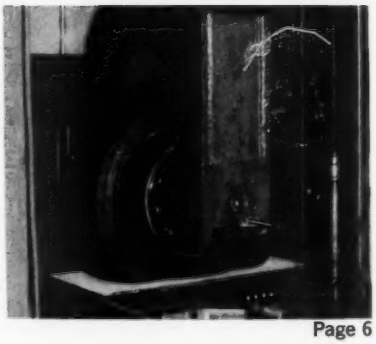

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Booming growth of all segments of aviation steps up demand for air traffic services. New fuel and passenger taxes proposed to help pay for improvements.

Expanding The Airways

Secretary of Transportation Alan S. Boyd has sent Congress two proposed bills which would provide new funds for Federal assistance to airport construction and for expansion and modernization of the national airspace system.

Under one proposal, the Federal-Aid-to-Airports Program, which for more than 20 years has provided up to $75 million a year in 50-50 matching grants for airport construction, would discontinue the grants after 1970 entirely except those airports where the only certificated service is provided by subsidized air carriers.

Principal Federal assistance to airports would consist of a loan program, with an authorization ceiling of one billion dollars, intended to encourage airport expansion on a viable economic basis.

The second proposed bill was designed to generate revenues for an expanded and modernized Federal airways system by raising the tax on passengers from 5 to 8 per cent, by imposing a new 8 per cent freight tax, and by a new fuel tax scheduled for general aviation increasing to 10 cents a gallon by 1972.

The current FAA budget for the airways program, $638 million, is expected to exceed $1 billion by Fiscal Year 1973. Revenue from airways users, currently estimated at $225 million, would rise to $760 million by FY 1973 if this bill is enacted into law.

The two bills are designed to help shift the burden of paying for the national airspace system and services from the general public to the aviation community.

In sending the bills to Congress, Secretary Boyd stated that "The aviation industry has reached a new stage of maturity. The evidence is clear that Federal grant assistance is no longer required in most airports. With few exceptions, the direct users of an airport are financially capable of bearing the full costs of development in operation. Certainly the unsubsidized airlines are capable, as a regulated industry, of bearing the full costs of their operations."

Secretary Boyd pointed out that very few general aviation airports charge any landing fee at all. "The impact of a modest fee, sufficient to develop and support these airports, would be negligible in most cases," he said.

The proposed new airports bill is based on the understanding that an airport is or can be self-sustaining. Federal loans would be authorized for only those airports considered economically justifiable, but for which loans in the private market could not be obtained on reasonable terms. Federal assistance would be available for projects related to landing areas and safety facilities. The bill is based on Secretary Boyd's belief that a reasonable system of charges for aviation services should provide communities with sufficient revenue to attract private financing of needed airport development.

The only matching grant in direct aid that would still be available would go to assist airports where local service needs for air carriers justified a subsidy from the Civil Aeronautics Board. A ceiling of 100 million dollars has been placed on these grants. There are, however, special cases where Federal financial assistance would still be required, and the proposed bill would make this possible.

The proposed bill on airway user charges contains the following provisions: (1) increase the passenger ticket tax from 5 to 8 per cent, and impose a new tax of 8 per cent on air freight; (2) relieve the air carriers of all taxes on aviation fuel; (3) gradually increase the taxes on gasoline and impose new taxes on jet fuels used by noncommercial aircraft so that by 1972 taxes on all fuels would amount to ten cents per gallon.

These taxes are required, in the words of President Johnson, because "the rapid growth of commercial and private flying is creating demands for substantial expansion and improvements in the nation's air traffic control system. System improvement will require large additional outlays of Federal funds for investment and operations. Those who will benefit most from such expenditures, the aviation industry and the flying public, should pay their fair share of the costs of the system needed to handle the increase in air traffic while maintaining a high level of safety. I do not believe the general taxpayer should be asked to shoulder this burden." ■

Filming and Flying

The photographer-pilot was skimming in in low to get a shot of a dusty, tree-lined farm in Glendevey, northern Colorado. Maneuvering the aircraft into position, he propped the control stick between his knees and scanned the scene through the viewfinder of his 35 mm. camera. At exactly the right moment, he tripped the shutter—a perfect picture, and his last one. He died in the crash which occurred a few seconds later.

The pilot was a professional photographer. Crash investigators recovered his camera intact, removed the film and had it processed. The last shot was sharp and clear—a detailed view of the crash-scene-to-be. He was also a skilled pilot: why did he crash? J. H. Prendergast, FAA supervising inspector for the Boise, Idaho, General Aviation District Office, who participated in the investigation, believes that a contributing cause was "hypnotic fixation"—the tendency of some photographer-pilots to become so entranced with picture-taking that their attention is fatally distracted from the business of flying an aircraft.

Aerial photography has added a new dimension to the cameraman's art and unveiled marvelous new vistas to the public eye. Modern light aircraft, with their excellent cabin visibility, operational stability, and ease of handling, have provided photographers with flying platforms for using their cameras to advantage, while eliminating much of the hazard formerly associated with such work. However, aerial photography still figures prominently in the annual toll of general aviation accidents and fatalities.

Tragic Pattern

The common pattern in these tragedies appears to be the temptation on the part of the photographer to act as his own pilot (or vice versa). Although flying an airplane requires little physical effort, it demands a high degree of attention, and the demand is constant. Such commonplace tasks as changing film or lenses, adjusting shutter speeds or apertures, require two hands—which the pilot may not be able to spare. Under the stress of handling both the airplane and the camera, pilots doubling as photographers have failed to perform such elementary tasks as removing the lens cap, thereby wasting the entire camera run.

Sometimes the subject being photographed strikes back, as the pilot of a military observation plane in Alaska discovered recently. Skimming over rugged terrain near Yakutat, Alaska, he went in especially low to photograph a large brown bear. Annoyed by this invasion of privacy, the bear took a swipe at the plane, damaging it enough to send the pilot into an emergency landing at a nearby airport. (The bear was unable to fish for a week.)

Camera missions over wide open spaces can be deceptively dangerous. A disabled seaplane adrift on an Alaskan lake enticed a pilot-photographer to a close-in shot. The dead calm air, desirable as a stable airborne photo platform, left the surface of the lake so glassy the pilot simply flew into the water while trying to adjust the viewfinder. He was lucky enough to swim away from the crash.

Horse Downs Plane

A Montana rancher similarly addicted to the close-up almost closed the book on his career when he attempted to shoot a thundering herd of wild horses while trying to fly his plane. When the herd suddenly swerved, the rancher whipped the plane steeply to follow it. The flying cowboy sheared about three feet off the plane's right wing when he struck and killed a horse. Good airmanship, reinforced with lots of luck, enabled him to bring the plane in safely.

All three of these accidents could have been avoided by the application of common sense—and facing the fact that flying is a full time job, as is aerial photography. To mix the two is to invite disaster, and to risk ending up with no film to show for the effort made.

The telephoto lens is very helpful in aerial photography in eliminating the need for flying dangerously close to the ground or to other aircraft. Federal Aviation Regulation 91.79 prescribes a 500-foot minimum

Good aerial photography does not require low level flying. Modern cameras, with proper lenses, are capable of detailed shots at safe altitudes.

altitude for flight over a populated area unless a waiver is obtained. The telephoto lens can simulate the photo effect of nearness that otherwise might endanger lives needlessly.

Apart from distracting the pilot's attention, camera equipment has other potential dangers in the cockpit. For example, the top of the instrument panel is no place for a light meter or for cameras equipped with built-in light meters. All light meters contain permanent magnets which can distort compass readings.

Photo gear bags are fitted with ingenious loops and pockets for spare lenses, filters, camera chassis, film, etc., but a photographer working in the tight confines of a twisting and turning cabin frequently finds himself scrambling for a piece of equipment that he had laid down on a seat "for just a second."

Shooting through an open door with movie or still camera calls for a secure restraining belt. Leaning out the doorway is a needless hazard.

Loose camera equipment has been known to drop into small crevices and jam control levers in the cockpit. A wide-mouthed, catch-all bag for temporary storage of camera components is a good accident preventer. When a photo mission is completed, all equipment should be stored in its proper place *before* leaving the vicinity of the plane.

Secure Cameras

Cameras, particularly if they are to be thrust out of the airplane, should be secured by a stout lanyard. The sudden blast of the slipstream can flick a camera from the hand, especially if the fingers are sweaty or if thick gloves are worn.

Large movie-type cameras should not be used in the front seat if they might interfere with free movement of the control column. Investigation of a fatal accident a few years ago off Catalina Island, Calif., indicated that the photographer, who was riding in the front seat, accidentally jammed his bulky camera in the control wheel, and was unable to remove it in time to prevent a crash.

In small, two-place aircraft, the photographer must be alerted to the danger of pilot obstruction. While a pilot and cameraman team were shooting a train wreck in a Colorado canyon, the latter, unwittingly, almost caused their tandem-seater to crash. Both were professionals. The pilot was devoting full attention to flying and the photographer was concentrating on his job. When the pilot attempted to pull out of a shallow dive, the plane failed to respond as the pilot pulled back on the stick. The desperate pilot finally heaved the plane's nose up by sheer strength, after realizing that the photographer had his foot braced against the stub where the stick is normally attached near the rear seat.

There should be a clear understanding between pilot and photographer—before the mission commences—on the exact nature of the assignment, the weather conditions en route and at the scene, and the limitations of the aircraft. The terrain should be examined beforehand, if possible, particularly in the case of mountain or canyon flying. Box canyons end abruptly and many canyons and valleys are spanned by nearly invisible cables or powerlines.

Photographing crop dusters requires special appreciation of the hazards involved. Flying under and over wires, sudden pull-ups and wing tip turns—normal maneuvers for ag aircraft—may be hazardous to the camera plane. A danger often overlooked is the chemical being dispensed—stay upwind of all dusting and spray operations to avoid the possibility of flying into a deadly cloud.

Aerial photography at night makes heavy demands on the pilot. The sudden transition from the surrounding blackness of the night skies to a brightly lit area, such as a sports stadium, can cause disorientation. Recently *two* airplanes attempted to photograph a night football game at the same time. Both planes narrowly missed a network of wires in their hasty withdrawal.

If there is one particular photo mission that requires exact planning, it is formation flying. Problems such as wake turbulence, sun glare, etc. must be anticipated. A moment of inattention could produce a mid-air collision. Exact filming sequences should be worked out on the ground, with all persons involved participating in the briefings. Good radio communication between aircraft is a basic consideration.

For the pilot who must do his own photography while flying alone, mastery of slow-flying techniques is an absolute. Some aircraft have greater inherent stability than others, but experience in trimming the controls is needed. There is no such thing as an airplane that will fly itself.

Nothing can create more confusion in an airport tower than an aircraft orbiting an active airport on a photo mission. Any assignment involving photographing aircraft taking off or landing at controlled airports, requires permission from the tower and the local general aviation district office.

Removing a Door

Authorization must also be obtained to operate an aircraft with one cabin door removed. (FAA Advisory Circular AC 91-1B lists aircraft eligible and the procedure for applying for permission.) Aircraft performance is affected in varying degrees with different aircraft makes and models when a door is removed. Limitations are placed on speed, angle or bank, etc. Webbing should be placed across the open door, as a safety precaution.

Similarly, FAA approval must be obtained for external mounting of cameras on any part of the airframe. Flight characteristics can be affected, and the structural integrity of the airframe could be weakened by ill-conceived modification.

Good pictures can be made from inside the cabin, shooting through closed windows, if these are carefully cleaned. This is a decided advantage when photographing in wintry weather. Turbulent air, and sudden maneuvers of the aircraft, however, can catch a photographer unaware when he is concentrating on the scene through his viewfinder. Timely warning by the pilot could save the photographer from possible facial bruises.

Knowing when to turn back applies to aerial photography as well as to other types of flight. If bad weather, condition of the plane or crew, or any other factor makes filming hazardous, go home and try again some other day. Leave the heroics for the film's actors, not for the man behind the camera.

Clifford Cernick

The minute or two spent on tire preflight represents a major investment in safety.

many happy landings

Pilots who wouldn't dream of taking off unless they were sure all gauges were in the green, that engine rpm drop during magneto and carburetor heat check was well within tolerance, and stick and rudder moved freely—these safety conscious aviators often pay only scanty attention to their tires. A dutiful glance, with maybe a desultory kick thrown for good measure, constitutes the usual tire preflight.

Potentially an aircraft tire blowout is at least as dangerous as an automobile tire failure. Students frequently make landing stalls 10 feet off the ground, and even more experienced pilots make "emphatic" landings from time to time, but the tires on a light plane are designed to absorb much punishment without doing more than shrieking. When a failure does occur, the finger of guilt generally points to improper maintenance.

Tire maintenance can be reduced to three easy words: inflation, inspection, storage.

Correct pressure varies with the size of the tire but is easily obtainable from the aircraft manual, an aircraft tire dealer, or an FAA certified aircraft mechanic. Proper inflation will see a tire through a good many landings: from 200 to 500, depending on the size and weight of the plane.

While both are built of the same materials, aircraft tires are designed to be soft in comparison with automobile tires.

Auto tires are designed to run long distances under a fairly constant, uniform load. Since a car is driven by wheel traction, tread must be thick, durable and have good gripping characteristics.

Tire Deflection

Not so the airplane tire, which rolls on the ground for comparatively short runs under a varying load. The weight on the tires becomes progressively less on takeoff as the wings exert their lifting power, and abruptly greater on landing because of loss of lift. Aircraft tires are designed to take this sudden change of weight without damage. The calculated degree of flexibility—deflection—is more than twice as great in airplane tires as in automobile tires, but under- or over-inflation can cancel out the most carefully made calculation.

Of these two damaging conditions, *under-inflation is the more serious.* It allows *too much* deflection, which can cause a tire to overheat, resulting in premature failure, or possibly in the rubber breaking away from the tire. The most likely result, however, is loss of ground control of the aircraft, which can lead to ground looping and even collision while taxiing.

The quickest clue to under-inflation is uniform, excessive wear on both shoulder areas of the tread. Wear on just one edge of the tread indicates improper camber (the slight angle from the perpendicular at which the aircraft wheels are mounted). Marked wear on one edge of the tread might also be traced to excessive "toe-in" or "toe-out."

In addition to subjecting the landing gear and airframe to the effects of a hard, jolting landing, *over-inflation* causes excessive wear on the tire crown. No matter how educated the toe, kicking the tire is not informative and may lead you to an orthopedist's door. Inflation should be checked with a tire gauge.

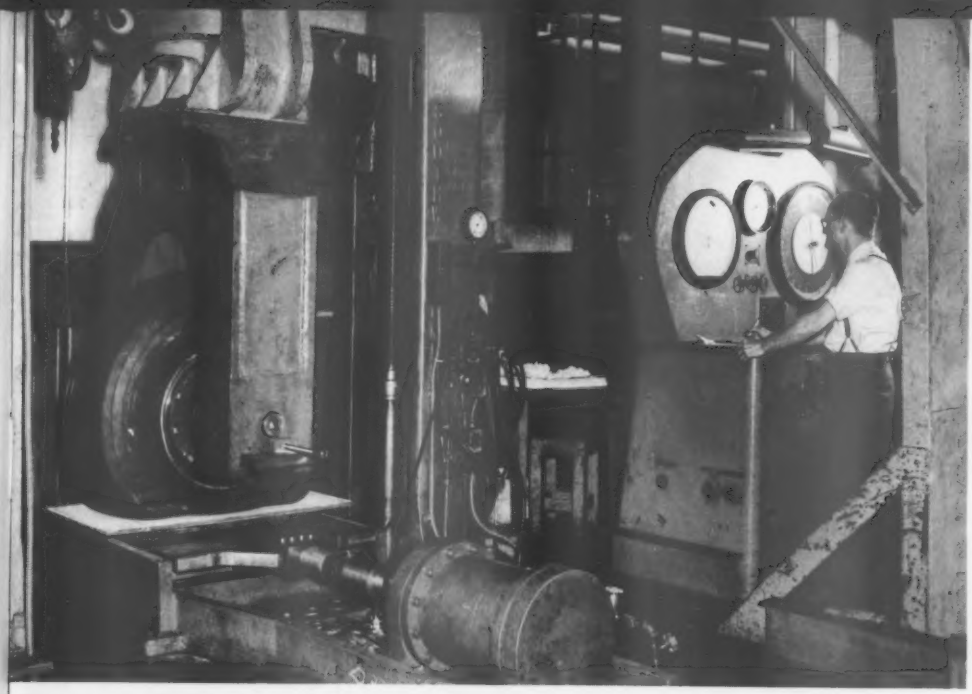
This is particularly important in winter, when a plane is moved from a warm hangar to the flight line, for the lower outside temperature reduces tire pressure. Air pressure loss due to temperature differences varies with the tire size but the loss can be estimated at one per cent of total pressure for each five degree drop in temperature. Tires on hangared aircraft may be safely over-inflated according to this formula.

While cold weather contracts and hardens rubber, this has no detrimental effect on the tire. It can, however, affect the O-rings which are used to seal wheel halves. The difference in contraction rates between the O-ring and the metal wheels can be great enough to permit a loss of pressure. Whenever a leak develops for no apparent reason, a defective O-ring is a likely suspect.

Frozen Valves

Slow leakage can result from stuck or "frozen" valves, a problem that can easily be averted by keeping valve stems capped *and* by making sure that only dry air is used to inflate tires. Frequently, valve leakage will correct itself after a few hours in a warm hangar but if there is any sign of deterioration or injury to the valve it should be replaced—cheaper peace-of-mind insurance would be hard to find.

While many automobile tires give the appearance of ruggedness with their deeply grooved treads, the over-all construction of an aircraft tire is actually stronger. Typical



Above—Aircraft tire is tested to destruction in never-ending manufacturer's tests. Left—Underinflated tires wear unevenly, make plane hard to control on wet runway.

This assortment of junk, picked up on the grounds of an airport, is not a rare haul.

automobile tires have two to four fabric plies, but even small aircraft tires have four to eight. Nylon, which provides greater strength at less weight, has largely replaced cotton and rayon in airplane tire cords. Greater abrasion resistance and longer tread life in aircraft tires have evolved from improved rubber compounds developed over years of extensive ground testing before taking to the air.

Compared with automobile tires, aircraft tires do no road gripping to speak of and consequently have little tread—but the grooves play an important role in preventing dangerous hydroplaning on rain-drenched or moisture-slick runways. Hydroplaning, a mysterious phenomenon that can send a landing plane skittering uncontrollably down a runway, can develop from either or both of two circumstances:

In one, the aircraft overrides a wave of water pushed out in front of the tire and is actually separated from the runway surface. In the other, a thin film of water develops between the runway surface and the tire. Called viscuous lubrication, this film is only one to two thousandths of an inch thick, but tests sponsored by the FAA have demonstrated that as much as 7,000 pounds of pressure per square foot may be needed to penetrate it.

The aircraft tire is grooved to permit water to escape under the tire. However, to be effective, tires should have at least 20 per cent of the tread remaining. For all practical purposes, anything less is a bald tire and should be replaced.

Like their automobile counterparts, aircraft wheels should be balanced whenever a tire is replaced. While an unbalanced wheel can also contribute to excessive wear, the principle danger is from serious runway vibration which can affect the airframe and give erratic instrument ratings. The greater the landing and take-off speed, the greater the need for wheel balancing.

Theoretically, landing a plane on grass will save tire wear and tear, but experience has demonstrated otherwise. Hidden debris —rocks, glass, bits of metal—and concealed unevenness of the terrain can lacerate the tire, break the cords and cause immediate tire failure. Even well cared-for, hard surface runways and ramps contain an impressive amount of nuts, bolts, and other foreign objects dropped or shaken loose from aircraft and ramp vehicles.

Destructive Fluids

Petroleum products and mineral fluids used in shock struts are destructive to rubber. If leakage stains cannot be removed with a dry rag, soap and water should be used—promptly. Whenever possible the source of this leakage should be discovered and corrective action taken.

Hangared aircraft should be stored in an area free of gasoline and oil. Many pilots use wheel shields made of plastic or similar liquid repellant materials to protect tires. In long-term storage, tires can be protected by oil drip pans suspended above them. Tires with nylon plies have a tendency to develop flat spots when left standing for any length of time. Suspending the aircraft from a strong support is a boon to the tires, when a long idle period is envisaged.

To prevent tire rot in long-term storage, aircraft tires may be kept from direct contact with concrete floors (which draw moisture out of them) by slipping a board under them. Another source of tire deterioration may be electric motors in use near stored aircraft. Electricity changes the molecular structure of oxygen, creating ozone, which prematurely ages rubber.

Despite the overall durability of aircraft tires, and their fine safety record, each landing and take-off provides a critical test of how well the pilot has looked after his rubber. A strong but soft—not "soggy"—tire is a happy one. ■

(A second article on tires will discuss repair of tires and the range of currently available types.)

With the new FSS Direction Finding Equipment . . .

It's Hard to STAY LOST

Doppler DF antenna atop Morgantown, W. Va., flight service station shows characteristic two tier array. Each tier has 16 dipoles.

FAA air traffic specialist demonstrates triangular doppler DF approach. The aircraft is brought over the DF antenna and given a series of headings that will bring it in line with landing runway.

With more than 50,000 new student pilots taking to the air each year, there is a good possibility of someone getting lost every day of the year, particularly on a cross-country flight.

The chances of *staying* lost for any length of time, however, are being dramatically reduced, thanks to FAA's ever expanding net of VHF/UHF ground-based doppler direction finding units.

Take the case of the pilot lost in the mountainous area of Parkersburg, W. Va., in an unfamiliar, rented aircraft with his wife and son aboard. He called the Parkersburg Flight Service Station and asked for a radar vector, saying his VOR receiver was apparently giving him an erroneous reading. As close as he could figure it, he was somewhere northwest of the Parkersburg VOR, but his several attempts to overfly it were unsuccessful.

Parkersburg contacted the Cleveland Air Route Traffic Control Center for a radar fix. But on the chance that the lost pilot was out of radar range, a call for assistance also went out to the Morgantown FSS—the nearest facility with direction finding service. The lost pilot was promptly located about 30 miles southeast of Parkersburg. Direction finding service provided him with guidance to the airport, where he made a routine landing.

(Upon examination, the VOR receiver was exonerated. The pilot was at fault. Unfamiliar with the equipment, he had been reading the VOR "From" bearing as "To," and this led to his plight.)

Thousands of FAA Flight Assist Reports attest to the efficiency of the new FSS direction finding equipment. In 1967, for example, flight service stations rendered 1,121 flight assists to lost pilots, using doppler D.F. Airport towers participated in 297 assists and air route traffic control centers in 43. In the first three months of this year, flight service stations recorded 324 doppler D.F. assists, with towers participating in 109 and ARTCCs in 12.

What is this new FSS direction finding service, and how does it work? The direction finder is essentially a radio receiver capable of receiving any selected VHF or UHF signal. At 1,000 feet above ground, the range is 45 to 50 miles. At 8,000 feet, the range is approximately 125 miles. By way of comparison, the latest airport surveillance radar (ASR) has a maximum range of 60 miles.

Furthermore, the new direction finding equipment makes use of the "doppler effect" of wave perception to "bend" the signal so that reception is not strictly limited to line of sight—as is the case with radar. Also, small aircraft which may be picked out on radar only with difficulty under certain atmospheric conditions, are clearly seen on the direction finder scope.

The direction finder console has two rows of channel selector buttons, 10 for VHF and 10 for UHF, covering the range of common use frequencies. When a button corresponding to a pilot's transmitting frequency is punched on the console, a thin strobe light darts out from the center of the cathode ray tube of the direction finder scope and paints a line directly to the source of the transmission. Encircling the face of the direction finder scope is an azimuth scale marked off in 10° segments. The bearing of the aircraft in relation to the ground station is thus instantly known.

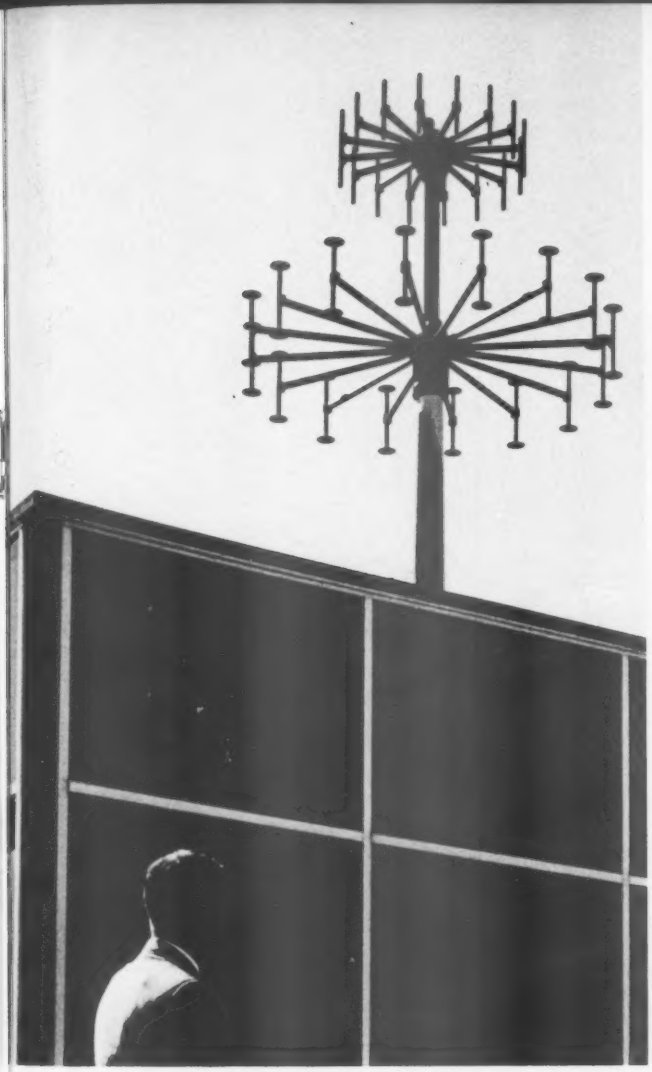
Determining the aircraft's distance from the antenna site is a simple triangulation exercise requiring little more than a minute. The system works equally well for high and low speed planes.

Exactly what happens when a pilot is confronted with the awful fact that he is lost, perhaps on top of an overcast, low on fuel and with night approaching? The first thing to be discarded is pride—he should switch his radio to 121.5 MHz (the emergency VHF channel) and tell his problem to the world. Delaying the call only adds to the hazard. The single word "Mayday" is sufficient to set comprehensive rescue machinery into motion.

Assuming his call is received by a doppler DF-equipped flight service station, the pilot would be asked his aircraft number and type, altitude, air speed, fuel remaining and compass heading. This quick inventory of facts serves two purposes: it lets the pilot know that he has been heard, and it provides the flight service station specialist with important information about the plane's capabilities and the pilot's frame of mind. (It also helps steady the panicky pilot by giving him some simple tasks to perform.)

At this point, the DF operator takes charge. His assured voice carries with it authority gained from both simulated and actual experience.

Supposing the lost pilot informs the FSS



Left—Specialist in Morgantown FSS plots line of position of plane from station. DF gives instant bearing from station. Below—DF scope is in foreground. Stopwatch, computer and plotting board are vital aids.

that he is on top of an overcast, at 6,500 feet and flying a heading of 060°. He has 30 minutes of fuel aboard. And for good measure, he adds that he is not instrument rated.

The pilot is instructed to transmit by depressing his mike button for 10 seconds. The DF strobe line indicates the aircraft to be on a 90° bearing from the DF antenna. The pilot is told to turn to a compass heading of 360° and fly this course for one minute. A minute later, when the pilot has complied with a request to transmit again, the DF strobe indicates a bearing of 80° from the antenna. He has transited a 10° arc in 60 seconds. Given the airspeed, wind direction and velocity, it is a simple matter to calculate the length of the hypotenuse of this triangle. The DF operator now gives the lost pilot a 260° "steer" toward the DF antenna, and informs him as to his estimated time of arrival.

When the pilot arrives over the DF antenna, he is guided to a point where he can see the runway, or if the ground is obscured, he is provided with an emergency doppler DF approach.

Each doppler DF-equipped flight service station has an emergency DF approach chart tailored to the station's specific airport configuration. These are restricted, approaches to be used for emergency situations only and with non-instrument rated pilots, and are not intended as substitutes for standard instrument approaches.

In a typical doppler DF emergency approach, the aircraft is brought across the DF doppler antenna site, and then turned to an outbound course which establishes a 30° angle of divergence with the eventual inbound course. The pilot flies the outbound leg for three minutes, at which point he makes a 120° left or right turn onto the base leg, perpendicular to the final approach course. The aircraft is then flown on base until the DF operator determines that it is within 10° of the final approach course. Now a 45° left or right turn is made, followed by a second 45° left or right turn when the aircraft is within 5° of the final approach course, according to the direction finder. The pilot is then instructed to descend to minimum authorized altitude. If the procedure has been properly executed, the pilot should be in a position to make a normal landing.

The FAA is ready, and will be even better prepared in the years ahead, to give this kind of flight assistance. As of early May, 120 doppler direction finders were in commission, and new ones are being added at the rate of two or three a month. In all, there will be 188 UHF/VHF doppler direction finders installed as part of the present program. Future plans call for about 200 additional direction finders to fill the gaps in the present network. These will be installed at the rate of 40 a year over a five-year period.

Flight service stations and combined station/tower installations having doppler direction finding equipment are identified in Part 3 of the *Airman's Information Manual.* Since Part 3 is amended and brought up to date every 28 days, new DF sites are listed almost as soon as they go into commission.

The *average* cost for electronic components and installation for a VHF/UHF doppler DF is approximately $45,000. Compared to the average cost of an airport surveillance radar installation (three operational scopes and one standby scope)—$991,000—the doppler DF is an incomparable bargain. ■

Washington Center (Leesburg, Va.) has electro-luminescent map boards and revamped consoles developed under "Operation Bootstrap." A sound-deadening floor covering will be added to soak up the sounds of bells, buzzers and conversation.

Bringing the Radar Room Out of the "Dark Ages"

OPERATION BOOTSTRAP

Before—Low light level in radar scope area leaves much of console in dark shadow. Controllers must make frequent reference to charts and other printed data.

A chair by any other name may look the same, but when designated a "working position" in the parlance of FAA's Air Traffic Service it becomes as important to its rider as the working pony is (or was) to the cowboy. When the safety of hundreds of airborne persons depends upon instant, accurate responses on the part of an air traffic controller seated at a radar console, his worksteed must be capable of responding immediately to his every movement.

Not only the chairs, but also the lighting, the air, the noise, and all other important aspects of the controller's environment have been studied by FAA engineers as part of an effort to improve the working conditions in FAA's en route traffic control centers and control tower IFR rooms. The latter are known as TRACONs (Terminal Radar Control).

The working position in a TRACON used to be literally a seat in the dark. In the early days of radar use in air traffic control, lighting was rigorously subdued in order to provide maximum contrast on the scope. The walls of the room were either windowless, or in some TRACONS they were painted black. Eyestrain and headaches were frequent complaints, as controllers leaving the TRACON blinked in the sunlight like coal miners coming off a workshift.

Heavy Workload

The growing burden of air traffic control in the safe separation of aircraft has pointed up the need for achieving maximum efficiency in controller work. Over the years, personnel complements have been increased, equipment has been modernized and computers put to work. These improvements have helped make possible the fantastic workload carried by the Air Traffic Service, which handled over 50 million IFR flights in 1967.

But only recently has the environment of the controller come under scrutiny as a factor in work capacity. FAA design engineers became convinced that poor lighting, stale air, excess noise, as well as physical discomforts due to the poor adaptability of the standard government office chair for the task at hand all added unnecessarily to the normal stress of the controller's job.

Accordingly, "Operation Bootstrap," a program intended to turn former "black holes" into pleasant well-lit, air-conditioned work rooms, is now in full swing.

18 Month Life Expectancy

One of the first objects of study was the chair. The standard equipment which supports the great majority of workers was found to have a life-expectancy of only 18 months in a radar room. The chair was not only occupied 24 hours a day by three different shifts involving men of different shapes and sizes, but it was also subjected to far more movement than it was originally intended for. The working area of many controllers includes a radar scope and other components of a console, including a flight strip rack and a battery of radio and telephone equipment. A busy controller is often literally a man in motion, sliding back and forth rapidly along the console on the seat of his pants, while responding to the needs of a sky full of airplanes that must be safely guided to their destination.

New designs now undergoing field trial include a sit/stand, or stool-type chair for the coordinator, an armless chair for use where minimum space is available, a short-backed chair for use where the coordinator works directly behind the controller, and a strong-backed chair with short arm rests. All have larger castors than the standard office chair, for greater mobility.

Once an idea enters the National Aviation Facilities Experimental Center at Atlantic City (NAFEC), the problem is simulated in a mock-up in order to expose the specific difficulty and to anticipate new problems that might be created by proposed solutions. This is vital because of the interrelationship of so many of the components in a center or TRACON. A chair that suits a controller at one position might be a back breaker at a different position. Good lighting on one piece of equipment might produce glare on another.

Equipment concepts frequently start out as lines chalked on the floor and progress to three-dimensional cardboard replicas, which eventually are refined into stout plywood mock-ups capable of supporting

Geometric white blocks above controller positions are sound absorbers which help mute the din of necessary controller conversation. Other sound-blotting methods are used to soak up noise from other sources.

After—Sector coordinator directs 8 to 10 controllers from this new sit/stand chair under evaluation. Back-lighted map boards and flight progress strips are illuminated by lighting developed under "Bootstrap."

heavy electronic equipment. As the concept develops, a complete environment might be created, including operational radar scopes, radios, weather displays, switch panels, and seating positions.

At various stages of development and modification, practicing controllers are brought in from the field to put the laboratory creations through their paces. These men know it "like it is" in actual, day-to-day air traffic control situations, and they don't hesitate to speak out when a piece of equipment fails to measure up. NAFEC engineers and technicians have the advantage of getting user comments before committing hardware. Where doubt exists, a 24 hour field trial operation identifies "bugs" and finalizes design.

The application of television to radar display has already done much to brighten a controller's day (or night). In the process called "scan conversion," the sweep of the antenna on the cathode ray tube is photographed by a television camera and displayed on a screen comparable to the home TV screen. Radar rooms are still windowless for the most part, but the black wallpaint is disappearing and the light level is no longer spooky. The black walls and ceilings are giving way to "decorator interiors" with light colored drapes and light colored, matte-textured paint finishes.

The design of lighting for centers and TRACONs has been a challenging problem. Controllers must have effective illumination for reference material, such as flight strips, maps and charts, but not at the expense of undesirable reflections. The surrounding light must be bright enough to minimize eye strain, without "washing out" the images on the radar displays.

Strategically placed fluorescent fixtures with effective louvers, projection-type lights with variable apertures, and electrical dimmers permit customized light levels to get the maximum performance out of the equipment with the minimum demand on the man.

"Sandwich Backlighting"

Electro-luminescent panels—plastic "sandwiches" with an electrically excited phosphor filler—provide backlighting to illuminate static information displayed on the console, or on the walls, such as charts, maps, communication codes etc.

Technical progress, unfortunately, almost always adds a new source of noise to the already impressive accumulation of bells, gongs, whistles, buzzers, chimes—and chattering people. The constant use of radio communications and the steady grind of computers and automatic typewriters have created serious acoustical problems.

This annoying and fatiguing distraction can now be largely "blotted" up by installing sound absorbent carpeting, drapes, acoustical tile and noise deflecting devices. The carpeting carries a bonus value. Not only does it contribute to a pleasant working atmosphere, but it also softens glare, increases leg and foot comfort, and makes floor maintenance easier and cheaper.

Not only noise but excess heat is given off by the large and varied assortment of electronic machines at work in a radar room. Air conditioning, the answer to many a sweaty controller's prayers, is now coming into general use.

"Operation Bootstrap" has converted ideas into practical programs which any facility is free to incorporate. To insure orderly procedure, and to inform facility chiefs of what has been done, FAA's Systems Research and Development Service is issuing a handbook describing each modification or innovation tested and approved in FAA laboratories or field facilities.

Wall-to-Wall Carpeting

What can be done, using these handbooks as a guide, is plainly evident in the TRACON at Boston's Logan International Airport. Controllers there work in a room with a two-color paint scheme, red wall-to-wall carpeting, dimmer-controlled wall and console lighting and electro-luminescent map displays. Sunlight is barred by double-layered aqua-colored drapes on the windows.

Two rows of equipment are divided by a floor-to-ceiling partition, creating well-lighted, spacious maintenance areas behind the radar and communications consoles. Air conditioner noises are masked behind another partition, and more noise is absorbed by a suspended acoustical ceiling that not only improves sound characteristics, but enriches the room's appearance by hiding the complex mass of wires, air ducts and service conduits.

The first facility to be "Bootstrapped" was the TRACON at Philadelphia's International Airport, which was soon followed by TRACONs in Chicago, Cleveland, Louisville, Nashville, and New York. In all, 12 TRACONs have already been sent to the beauty parlor, and 40 more are in various stages of improvement. Eventually, all 117 will be modernized.

For those who remember air traffic control of 30 years ago, when much of it was done with signal flags, flashlights and lanterns, all this research on such projects as more mobile and comfortable working positions may sound like gilding the lily. But anyone who has recently spent even a few minutes in an IFR room, during a period of busy traffic, will testify that the controllers at the scope deserve all the help we can give them. In their business, there is no margin for error. ■

famous

FLIGHTS

Ruth Elder...

First Woman Over the Atlantic

Above—the daring aviation beauty gets into her flying togs just before takeoff on the adventure-filled Paris trip. Below—As a famous aviatrix and leading lady for Hoot Gibson in Universal's production, THE WINGED HORSEMAN, Miss Elder reflected the spirit of aviation in this dance interpretation.

Above—Ruth Elder, as fledgling pilot, poses beside the Waco 9 aircraft in which she learned to fly.

In the jazzy, post World War I days of bathtub gin and "oh-you-kid," a young beauty named Ruth Elder made a gallant effort to be the first woman to cross the Atlantic by air.

The nation was looking up—up—up. Energetic young men who could not find airplanes were shinnying up flagpoles and setting endurance records on the swaying pinnacle.

Already in 1927, 1,857 airplanes were registered with the Aeronautics Branch (including 37 aircraft without engines). Colonial Air Transport had inaugurated regular commercial airline passenger service between New York and Boston, and the air age set in in earnest. It was a great time for "firsts"—the highest, the farthest, the fastest.

Ruth Elder, a pretty, young dental assistant from Florida, bitten by the flying bug, told her flight instructor, George Haldeman, "I'd like to be the first woman to fly across the ocean." The daring suggestion set well with Haldeman, a barnstorming ex WWI pilot. He had wanted to be the first man to fly the solo hop, but Lindbergh already had earned that place in history. Here was another chance at fame—with a beautiful girl to attract the necessary financial backing and the headlines.

Haldeman's friends raised $50,000, which were used to purchase a Stinson monoplane and cover expenses of the Atlantic flight. He equipped it with the best instruments he could get at the time and learned what he could about instrument navigation from air mail pilots experienced in cross-country flying.

Ruth Elder and George Haldeman spent 100 "shakedown" hours in the new Stinson. They flew with simulated heavy loads, and sought adverse weather to test their own mettle and skills as well as the "personality" of the airplane. Wherever they went, the press was there to capture the saga of the daring young American girl. Appropriately enough, the airplane was named, "The American Girl."

The course they mapped out included 3,600 miles over water, 400 miles longer than the route Lindbergh chose for his epic flight. They set their course above the sea lanes where a line of vessels would be their insurance against disaster.

By the time the shakedown flights and the waiting were over, Ruth had logged close to 200 hours of flying time.

Once the shakedown was over, the two flyers waited at Roosevelt Field, New York, for good weather. While waiting, they sent radiograms to 24 ships along their proposed flight route. Eighteen replied, giving their positions and weather conditions, and assured the two pilots that they would be on the lookout for "The American Girl."

The flight took off from Roosevelt Field, October 11, 1927, at 5:30 p.m., almost at sunset. Both pilots wore specially designed flying suits which would keep them afloat if they had to ditch, and eliminated the need to carry heavy life rafts.

First word of the flight's progress came the next day, October 12, from a vessel which had sighted the plane 400 miles east of New York. The next word came when they were 800 miles due west of Paris. But the going began to get rough, and they were blown south of their course by an ocean storm. Their radio went dead. It seemed as though things couldn't get worse, but they did. A crack appeared in their oil tank, and it was evident to the two pilots that they would not reach Paris, at least not by air. With the cold pounding ocean below, the prospect of ditching "The American Girl" was not an inviting one, so they flew on, fearing that at any moment the overheated engine would catch on fire. Ruth cut a large hole in the side of the airplane in case they had to make a quick exit.

Fate, however, was kind. They spotted a ship on the horizon, the Dutch oil tanker, S.S. "BARENDRECT." Haldeman took over the plane's controls and made several passes over the tanker while Ruth dropped notes aimed at the tanker's deck informing

the Captain that they were planning to ditch.

One finally met its target. Though the sea was rough, Haldeman brought the plane down neatly on the crest of a wave. Fortunately, the plane stayed afloat, for it took the tanker's crew two and a half hours trying to retrieve the two pilots. The crew then tried to hoist the plane aboard, but a fuel tank burst into flames and the plane sank.

As the tanker's radio transmitter was not operating, the world, with no further word from "The American Girl," assumed they were lost at sea. Banner headlines carried the sad news.

The S.S. "BARENDRECT"—in silence—carried the sea-wrecked adventurers to Horta, in the Azores. When the telegraph lines finally crackled with the news that the flyers were safe, the world press again gave them front-page attention.

After a few days rest in the Azores, both pilots boarded a ship bound for Lisbon, a bomber to Madrid, an overnight train to Bantz, and finally arrived in Paris aboard a Potez 25. Paris welcomed them with enthusiasm. The daring flight, the dramatic rescue, a beautiful girl and World War aviator were the perfect combination for the times which doted on dash and daring.

A full blown ticker tape parade and reception at City Hall greeted the two flyers on their return to New York. They were the hero and heroine of the day.

All the headlines generated by the flight did not endear Ruth Elder to other women flyers, who accused her of being a publicity seeker. To escape this image, Ruth entered the first all-women air race, the "Powder Puff Derby." In spite of rough weather and the loss of her maps, which blew out of the plane, Ruth finished fifth, winning $525. More important, she won the respect of other flyers.

She again proved her ability as a capable pilot in the 1930 National Air Races, where she won a major trophy.

Flying fame brought Ruth to the attention of Hollywood movie makers, who eventually persuaded her to give up flying in favor of movie roles. The honor of being the first woman in aviation was left to Amelia Earheart who successfully flew the Atlantic in 1928.

Haldeman, on the other hand, continued his aviation career with the Federal Aviation Administration's predecessor, the Civil Aeronautics Administration, as head of the agency's engineering and manufacturing division. He later joined National Airlines as assistant to the president, but returned to government service with the Civil Aeronautics Board as special assistant to its director. Now retired from government, he lives and works in Florida as an aviation consultant.

Ruth, once everyone's ideal as "The American Girl"—now lives with her husband in Kamuela, Hawaii.

Marcella Harp

BRIEFS

• COMMERCIAL PILOT TRAINEES ARE NOW ELIGIBLE FOR LOANS under the National Vocational Student Loan Insurance Act. To obtain the up to $1,000-a-year loans the student must be in full-time attendance at an eligible flight school, hold a private pilot's license, and meet FAA medical requirements for commercial pilots. There is no minimum prior education required and no age limitation, but the student must show an ability to pass FAA proficiency exams and become gainfully employed in commercial aviation. For more information write: Eligibility Unit-Vocational Education, Bureau of Higher Education, U. S. Office of Education, Washington, D. C. 20202.

• CURRENT AIR TAXI MAIL ROUTES as well as those under consideration by the Post Office are listed in a new FAA report. Expanded service ultimately will benefit 17,000 additional communities which will receive speedier mail delivery from sectional centers to be located approximately 1½ hours flying time from major air terminals. FAA is working with postal officials to provide the most efficient service possible within the existing system. Copies of "FAA and the Expanding Airmail Traffic" (AD 669003) are available for $3.00 each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Va. 22151.

• ACCIDENT PREVENTION SPECIALISTS are being assigned to FAA General Aviation District Offices as part of a new Flight Standards program to reduce accidents. Called "Project 85" (for the 85 FAA GADOs), the program begun on July 1 will undergo a two-year trial period in the Southwest and Central Regions. Accident Prevention Specialists will work directly with pilots on problems which could lead to mishaps in the air or on the airfield.

• FAA "BLUE BOOK" UPDATES AIRPORT CONSTRUCTION SPECS and refines existing standards to take advantage of technical developments in the field of airport construction. It covers clearing, grubbing, grading, drainage, paving, lighting and turfing; also, patents, liquidated damages, qualifications of bidders and certain administrative procedures. Replacing the nine-year-old "Red Book", "Standard Specifications for Construction of Airports" may be purchased for $3.50 from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

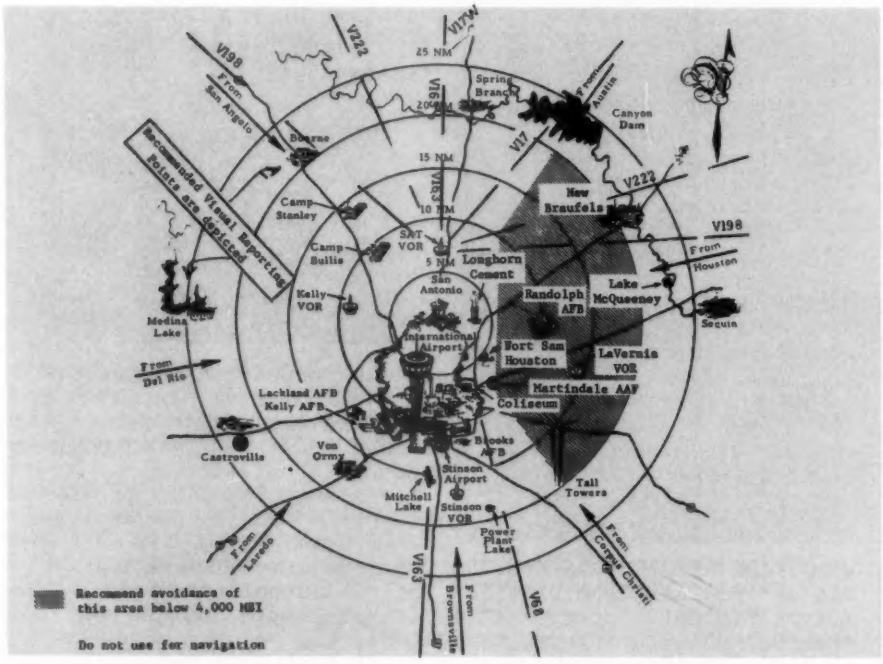
PILOTS FLYING TO SAN ANTONIO ALERTED TO TRAFFIC

Pilots flying into the San Antonio terminal area should exercise extraordinary caution because of the unusually large number of high speed military jet aircraft operating the year around in the near vicinity.

This warning from FAA has special meaning to the large number of civil itinerant pilots who will be visiting San Antonio for the first time this summer and fall. Visitor attractions include HEMISFAIR, 1968 (April 6-Oct. 6), and the Olympic Games in Mexico City (Oct. 12-27).

Military aircraft operate night and day from Randolph AFB, northeast of the city, from Kelly AFB, southwest of the city, and from Stinson Airport, south of the city.

Information concerning air traffic activities conducted within the area, services available to pilots, applicable frequencies, and landing areas is available from FAA air traffic facilities in Arkansas, Oklahoma, New Mexico, and Texas.



Suggested routes for planes coming from: North, V163; Northeast, V17W; East, V198. Maintain 4,000 or above till past shaded area. South, V68, V163; Northwest, V222, V198. Contact San Antonio Approach Control on 120.3, 126.5 or 134.1 MHz for radar advisories when 20 miles from San Antonio.

No Pause for Aerial Fire-fighters Who Reload On the Fly

Canada's flying forest fire-fighters have perfected a technique to replenish the water storage tanks in their "water bombers" with scarcely a pause in their operations.

They literally do it "on the fly," dipping down to any of the countless small lakes that dot the countryside like freckles. The Province of Quebec, for example, produced a study that shows that there is a 90 per cent probability of finding a lake 1.5 miles long within seven miles of any point in the province.

Using a *Canso* (née the U. S. *Catalina* PBY of WW II fame modified to an amphibian configuration), the Canadians land on a lake, and without stopping refill the plane's two 480 gallon tanks in 15 seconds.

After a normal letdown and landing, the pilot allows a few seconds for the plane to stabilize before lowering a water scoop mounted behind the step of the hull. The pilot then eases back on the wheel and applies power to keep the speed around 70 knots.

Windows in the tanks give the pilot a direct, visual readout when the tanks are full. The scoop is then raised, allowing the aircraft to accelerate and takeoff.

The Canadians have also been experimenting with "wet" water, so called because of chemical treatment which lowers water's normal surface tension and permits deep penetration; and with a chemically treated water that produces a jellied residue on all combustibles it strikes.

This has the advantage of making a given quantity of water go a longer way by reducing its evaporation rate.

Federal Funds Approved for Grooving Main Runways at Chicago's Midway

Chicago's Midway Airport will have its two longest runways grooved as an anti-skid measure under a $110,000 Federal allocation to be matched by the city. This is the first time Federal-Aid-to-Airport funds have been allocated for this purpose, following a successful trial use of this safety measure at several airports last year.

The grooves, which are ¼ inches wide, ¼ inches deep and spaced 1 inch apart, will be cut transversely in the runways to permit removal of excess water and reduce the danger of aircraft hydroplaning across rain-slick runways.

Other airports already grooved are Kansas City Municipal, Kennedy in New York, and Washington National Airport.

PARA-WING IS NEW RESCUE TOOL

Airborne rescue teams might have a new ace up their sleeves—a para-wing chute, built around the Rogallo principle, being developed for the Army under a joint contract with Goodyear Aerospace Co., and Ryan Aeronautical Co.

The glider is guided to its target by a ground-based radio beacon. The complete assembly, which can be folded into a four cubic foot package, including guidance system, weighs less than 80 pounds.

Still being tested by the U. S. Army Aviation Materiel Laboratories, Ft. Eustis, Va., the device has delivered cargo within 200 feet from target from altitudes as high as 30,000 feet and as far away as 12 miles.

"The Army's Golden Knights" use it as a demonstration of what imaginative engineering can do.

Rescue packages, such as life rafts, water, food and first aid equipment, could be delivered by this new radio-guided para-wing glider.

BRIEFS

• Mail Pilot Missed Indiana

The "Pilot Briefs" item about the recent transcontinental flight of "Old 249" in the April *Aviation News* was interesting—and a bit confusing. Your itinerary has the plane flying across Illinois and Ohio, without flying across Indiana. Please tell me how this was done.

Lee Leonard
Bloomington, Ind.

Pilot Bill Hackbarth crossed but did not land in Indiana on the Chicago to Bryan, Ohio leg. He took off from San Francisco and stopped at: Sacramento, Reno and Elko, Nev.; Salt Lake City; Rock Springs, Rawlins, and Cheyenne, Wyo.; N. Platte and Omaha, Neb.; Iowa City, Iowa; Chicago, Bryan, and Cleveland, Ohio; Bellfonte, Pa.; Hadley Field (near Plainfield, N. J.); Philadelphia; and Washington, D. C.

• Build Me A Balloon

Could you please ask one of your researchers to send me a list of balloon manufacturers? As a subscriber to *Aviation News*, and a great admirer of the replies you publish, I'm sure you'll be able to help.

Also, are there any recent books or reference material on ballooning which would be helpful in taking up this sport?

Desmond M. Chorley
Agincourt, Ontario

Two of the most active balloon manufacturers in the U. S. are: Raven Industries, Inc., Sioux Falls, S. D. 57100; and Semco Balloon Co., 3020 West Borchard, Santa Ana, Calif.

For general and specific information on ballooning write to: National Lighter-than-Air-Society, Inc., 1210 Massillon Road, Akron, Ohio 43306; and Balloon Club of America, RFD #2, Newtown, Pa. 18940.

Subject Guide to Books in Print, U.S.A. lists aviation books in print. Of recent interest are: "With Brass and Gas," by M. Baldwin, 1967, Beacon Press, N. Y. C., $6.00; and "Lighter-than-Air Flight," by Carroll V. Glines, 1965, Watts, N. Y. C., $5.95.

• Shotgunning Frequencies

We wholeheartedly endorse D. E. Furnal's procedure for communicating through a remotely controlled voice outlet. (Flight Forum, *Aviation News*, April 1968.)

If he were in our neighborhood, we would appreciate his identifying the VOR as Port Angeles, Seattle, or Olympia Radio, as appropriate. A call to "Port Angeles Radio" would get an almost instantaneous reply via that outlet. A call to "Seattle Area Radio" would entail delay until we identified the facility to which it was tuned.

An "Area" call often leads to the highly undesirable practice of salvoing or shotgunning frequencies.

Joseph W. Gunsolley
Chief, Seattle Flight
Service Station

Ed.— (Salvoing and shotgunning are terms used to describe the technique when an air traffic control specialist is not sure which frequency a pilot is transmitting on. He opens all his frequencies at his disposal, and transmits on all at once to be sure his reply is getting through.)

• Kinetic Energy or Force

The March issue of *Aviation News* carried an informative article on bird hazards to flight ("Fowled Air"), but I'm compelled to question some of the figures. Specifically, is the 8,000 pounds impact mentioned correct?

Here's how I figure it:

Aircraft speed = 200 mph = 294 feet-per-second

Bird weight = 2 lbs

$$KE = \frac{W\,V^2}{2\,g}$$

Where W = 2 lbs
V = 294'/sec
V^2 = 8.6436
g = 32.16

$$KE = \frac{2 \times 86436}{2 \times 32.16} = 2{,}687 \text{ foot-lbs}$$

R. A. Karlberg
Inglewood, Calif.

Your calculated figure of 2,687 foot-pounds represents the ***kinetic energy*** *imparted by the bird striking the aircraft. You will note that the 8,000 pounds quoted is a figure of* ***force.***

A force in this case is the push exerted by the bird on the aircraft. This is expressed simply in "pounds."

Kinetic energy, expressed in "foot-pounds," is the energy a body has by virtue of its motion. In this case, the kinetic energy that the bird imparts to the airplane is a function of the mass of the bird and the velocity (squared) between the bird and the airplane.

If the center of mass of the 2-lb bird travels approximately 4 inches in dissipating all the kinetic energy, a force will be imposed on the aircraft structure of approximately 8,000 pounds.

• Initial Approach

I have never been able to have anyone give me a precise definition of "initial approach" as referenced on many approach and landing charts. I believe a lot of other pilots would appreciate an explanation.

Washington

The initial approach commences when the aircraft has left the enroute phase of flight and is maneuvering to enter an intermediate or final segment of the instrument approach. An initial approach may be made along prescribed routes within the terminal area which may be along an arc, radial, course, heading, radar vector, or a combination thereof. Procedure turns and high altitude teardrop penetrations are initial approach segments.

Initial approach information is shown in plan view of instrument approach charts by course lines with an arrow indicating direction. Minimum altitude and distance between fixes is also shown with the magnetic course. Courses with the notation "NOPT" (no procedure turn) are not considered as initial approaches.

For further information see FAR Part 91.3 (c)(1), and FAA Handbook "U. S. Standard for Terminal Instrument Procedures (TERPs)," page 15, section 3—Initial Approach.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• Pilot Broadens Education

Every private pilot, particularly those who are instrument rated, should have the opportunity to visit an Air Route Traffic Control Center, as I did recently when I toured the Boston Center at Nashua, N. H.

I phoned and asked permission to visit the center and was invited to come on out. A supervisor was assigned to take me through and it was probably the most interesting hour and a half I have spent in a long time.

The Center personnel were both helpful and courteous in explaining the varied operations to me and they left me very favorably impressed with their competence and their desire to be of service to pilots.

Please convey my thanks to the Boston Center for their hospitality.

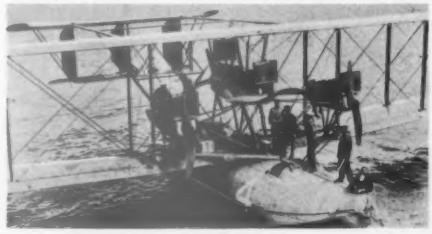
David H. Halke
Shreveport, La.

• Flying Boats and Seaplanes

The "Famous Flights" account of the trans-Atlantic hop of the NC-4 in the March issue of *Aviation News* referred to the plane as a flying boat. Were they more properly called biplanes or two-winged flying boats?

Seattle, Wash.

Biplane, of course, refers to any aircraft having two wings, one atop the other. A biplane can be equipped to land on land, water, snow, or a combination of these. The NC-4 was a biplane seaplane, strictly speaking. The term "flying boat" is merely a variation in terminology.



• Special VFR (Cont.)

February *Aviation News* carried an item about the termination of "Special VFR" clearances in 33 control zones. What is the reason behind this change? Was there a bad accident history that prompted the change of ruling?

Regulatory action was taken to assist in providing for the safe and efficient use of the airspace in the vicinity of airports serving large population centers. The action was taken to preclude, rather than to correct an accident history.

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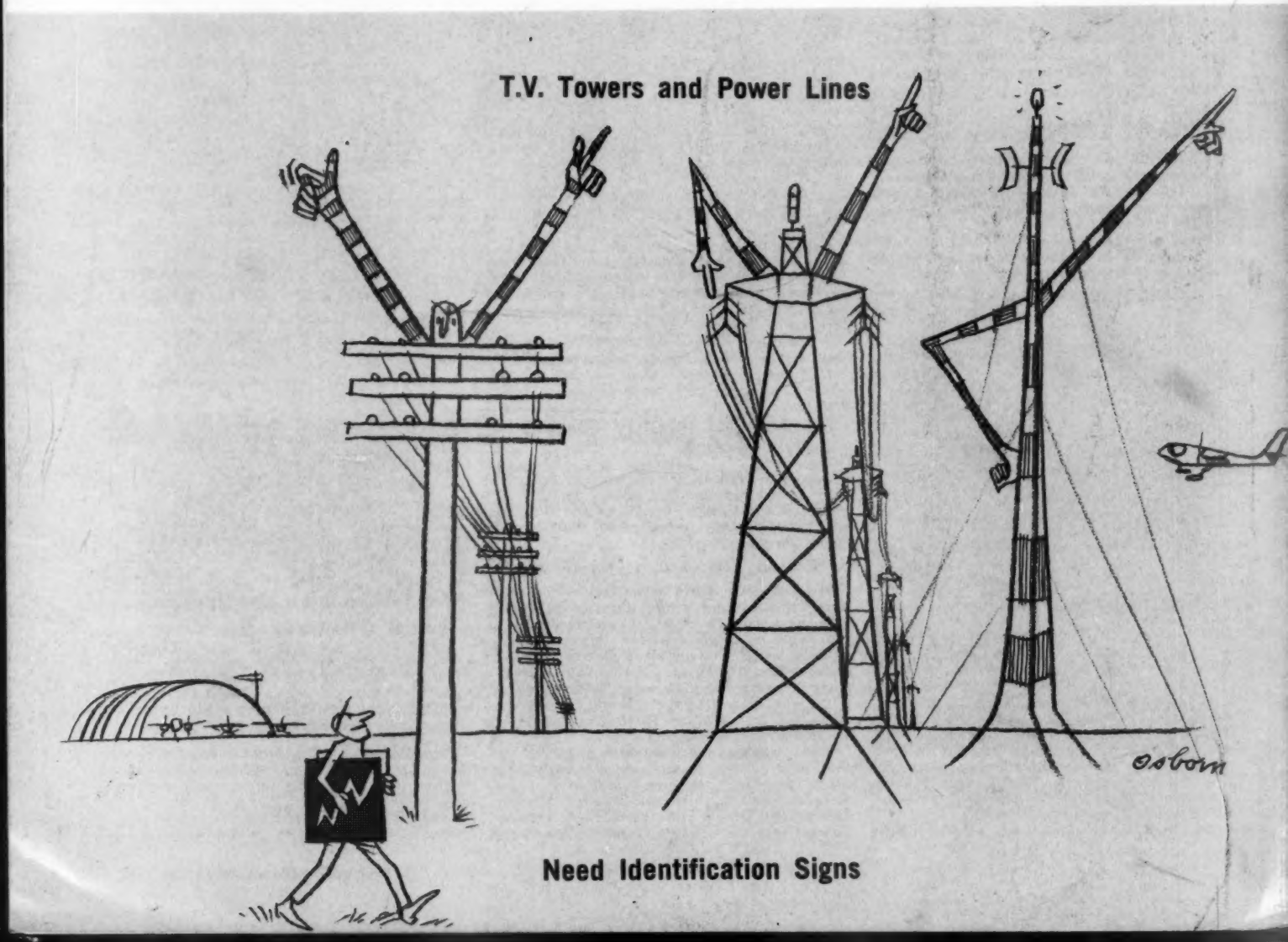
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